BA35X-VA Vertical Mounting Kit

digital

User's Guide

Part Number: EK–350SV–UG. A01

BA35X–VA Vertical Mounting Kit

User's Guide

Order Number: EK–350SV–UG. A01

This manual describes the rules for configuring the BA35X–VA vertical mounting kit and the procedures for replacing system building blocks (SBBs) and shelves.

Digital Equipment Corporation
Maynard, Massachusetts

First Edition: November 1992

The postpaid READER'S COMMENTS card requests the user's critical evaluation to assist in preparing future documentation.

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

This document was prepared using VAX DOCUMENT, Version 2.0.

Contents

Preface v

1 Introducing the Vertical Mounting Kit

1.1 Product Description 1–1
1.2 Configuration Rules 1–2
1.3 AC Power Distribution 1–3

2 Replacement Procedures

2.1 Components of the Vertical Mounting Kit 2–2
2.2 Installing SBBs 2–3
2.3 Replacing SBBs or Blowers 2–4
2.4 Replacing a Shelf 2–5

Index

Figures

1–1 Typical BA35X–VA Vertical Mounting Kit 1–1
1–2 Shelf Orientation in a Single Vertical Mounting Kit 1–3
2–1 BA35X–VA Vertical Mounting Kit Assembly Drawing 2–3
2–2 Slot Numbers 2–4

Tables

1–1 Physical Specifications of the Vertical Mounting Kits 1–2
1–2 Country-Specific Power Cords 1–4

Preface

The *BA35X–VA Vertical Mounting Kit User's Guide* describes the rules for configuring the BA35X–VA vertical mounting kit and the procedures for replacing system building blocks (SBBs) and DECstor/me modular storage shelves.

Intended Audience

This manual is intended for personnel who are responsible for configuring, installing, and using BA350 DECstor/me modular storage shelf subsystems.

Structure

This manual is organized as follows:

Chapter 1	Provides an overview of the vertical mounting kit and describes configuration rules and ac power distribution.
Chapter 2	Contains the procedures for replacing SBBs, blowers, and shelves in a vertical mounting kit. The sequence for installing SBBs in a shelf is also included in this chapter.

Related Documents

The following table lists documents (alphabetically by title) that contain information related to this product:

Document Title	Order Number
BA350 Modular Storage Shelf SBB User's Guide	EK–SBB35–UG
BA350 Modular Storage Shelf Subsystem Configuration Guide	EK–BA350–CG
BA350 Modular Storage Shelf Subsystem User's Guide	EK–BA350–UG
BA350–EA Modular Storage Shelf User's Guide	EK–350EA–UG
BA350–LA Modular Storage Shelf User's Guide	EK–350LA–UG
BA350–SA Modular Storage Shelf User's Guide	EK–350SA–UG
Installation Notice—RZ73 Bus Termination and Jumper Installation Guide	EK–RZ73X–IS
MicroVAX/VAXserver 3100 and DECsystem 5100 RZ25 Installation Guide Addendum	EK–RZ2MV–AD
RZ Series Disk Drive Reference Manual	EK–RZXXD–RM
RZ22, RZ23, RZ24 Disk Drive Subsystem Service Manual	EK–RZ234–SV
RZ24 Hard Disk Drive Installation Guide	EK–RZ24I–IS
RZ25–S Mounting Bolt/Bracket Installation Instructions	EK–RZ25S–IN
RZ2x Hard Disk Drive Upgrade Installation Instructions	EK–RZ2XH–UG

1

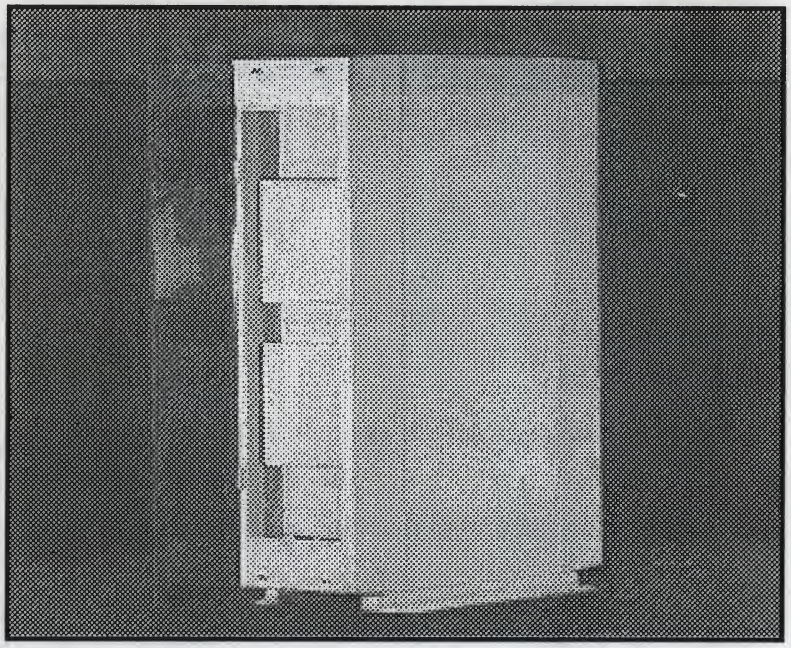
Introducing the Vertical Mounting Kit

This chapter describes the BA35X–VA vertical mounting kit. It also provides configuration rules and ac power distribution information.

1.1 Product Description

A **vertical mounting kit** is a floor-mounted stand that encloses a DECstor/me modular storage shelf. A typical BA35X–VA vertical mounting kit is shown in Figure 1–1.

Figure 1–1 Typical BA35X–VA Vertical Mounting Kit



CXO-3639A-PH

This manual refers to two versions of the vertical mounting kit: a single vertical mounting kit and a double vertical mounting kit, which are defined as follows:

- A **single vertical mounting kit** is used to enclose a single-height shelf such as the BA350–SA.
- A **double vertical mounting kit** is made up of two vertical mounting kits joined together and is used to enclose the double-height, BA350–EA shelf.

The part number for both versions of the vertical mounting kit is the same: BA35X–VA. Whether you purchase a single or double version depends on how many vertical mounting kits you order. For each single-height shelf, order one BA35X–VA vertical mounting kit; for each double-height (BA350–EA) shelf, order two BA35X–VA vertical mounting kits.

For example, if your configuration uses one BA350–EA (double-height) shelf and two BA350–SA (single-height) shelves, you would order four BA35X–VA vertical mounting kits:

- Two vertical mounting kits for the BA350–EA shelf
- One vertical mounting kit for each BA350–SA shelf

No tools are required to assemble or disassemble a vertical mounting kit—the parts "snap" together. Vertical mounting kits are shipped fully assembled with the ac distribution unit and the modular storage shelf installed. The modular storage shelf has system building blocks (SBBs) installed and small computer system interface (SCSI) buses configured according to the customer's order. Shelf power supplies are connected to the ac distribution unit.

The physical specifications of the vertical mounting kits are described in Table 1–1.

Table 1–1 Physical Specifications of the Vertical Mounting Kits

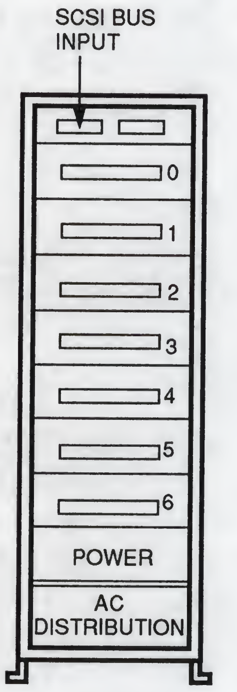
Specification	Single Vertical Mounting Kit	Double Vertical Mounting Kit
Height	578 mm (22.75 in)	578 mm (22.75 in)
Width	203 mm (10 in)	356 mm (14 in)
Depth	400 mm (15.75 in)	400 mm (15.75 in)
Weight	17 kg (37 lb)	29 kg (63 lb)

1.2 Configuration Rules

The following configuration rules apply to vertical mounting kits:

- Measure capacities by the number of shelves that can be installed:
  - One BA350–SA shelf can be installed in a single vertical mounting kit.
  - One BA350–EA shelf can be installed in a double vertical mounting kit.
- Connect no more than two vertical mounting kits in series to the same wall receptacle. (Each vertical mounting kit has an unswitched ac outlet for this purpose. See Section 1.3 for additional information.)
- Mount all shelves with the power supply at the bottom (slot 7), as shown in Figure 1–2.
- Reserve slot 6 for either a redundant power supply or a battery backup unit (BBU).

Figure 1–2 Shelf Orientation in a Single Vertical Mounting Kit



CXO-3633A-MC

To maintain the stability of a single vertical mounting kit, install SBBs in the order specified in Section 2.2.

1.3 AC Power Distribution

Each vertical mounting kit has an ac distribution unit that provides switch-controlled ac power to the shelf power supply. (The only exception to this is the double vertical mounting kit used with the SZ200 RAID subsystem, which has only one ac distribution unit.)

The ac distribution unit in your vertical mounting kit will be one of two types, depending on when you purchased your kit:

- The initial version of the ac distribution unit used with the vertical mounting kits had an *unswitched*, built-in, 10.2-centimeter (4-inch) power cord for connection to the ac distribution unit in a second vertical mounting kit. The short length of this built-in cord did not allow for much flexibility in configuration arrangements.
- The second-generation ac distribution units have replaced the unswitched power cord with a *switched* ac outlet. This ac outlet can be used for connecting either another vertical mounting kit's ac distribution unit or an optional redundant power supply in a BA350–EA shelf. In either case, you must order an ac power cord for this additional connection.

Table 1–2 lists the power cords available for ac distribution units. These power cords must be ordered separately because they are *country specific*. In general, the power cords listed in Table 1–2 have the following characteristics:

- Are rated at 10 amps at the specified operating voltage
- Are 2.5 meters (8.2 feet) long
- Have a country-specific plug
- Have an IEC 320 C–14 compatible connector

The only exception is the BN27S–03 power cord used in Japan and the United States; it is rated at 15 amps and is 3 meters (9.8 feet) long.

Table 1–2 Country-Specific Power Cords

Country	Voltage	Plug	Length meters (feet)	Part No.
Australia	250 Vac	AS 3112 - 1981	2.5 (8.2)	BN19H–2E
Central Europe	250 Vac	CEE 7/7 (Schuko)	2.5 (8.2)	BN19W–2E
Denmark	250 Vac	Afsnit 107	2.5 (8.2)	BN19K–2E
Europe—Central	250 Vac	CEE 7/7 (Schuko)	2.5 (8.2)	BN19W–2E
India	250 Vac	BS 546	2.5 (8.2)	BN19S–2E
Ireland	250 Vac	BS 1363	2.5 (8.2)	BN19A–2E
Israel	250 Vac	SI 32	2.5 (8.2)	BN18L–2E
Italy	250 Vac	CEI 213–16/VII	2.5 (8.2)	BN19M–2E
Japan	125 Vac	NEMA 5–15	3.0 (9.8)	BN27S–03[1]
New Zealand	250 Vac	AS 3112 - 1981	2.5 (8.2)	BN19H–2E
South Africa	250 Vac	BS 546	2.5 (8.2)	BN19S–2E
Switzerland	250 Vac	SEV 1011	2.5 (8.2)	BN19E–2E
United Kingdom	250 Vac	BS 1363	2.5 (8.2)	BN19A–2E
United States	125 Vac	NEMA 5–15	3 (9.8)	BN27S–03[1]

[1] This power cord is rated at 15 amps.

2.1 Components of the Vertical Mounting Kit

A standard vertical mounting kit is made up of the following components:

Note

The numbers in this list correspond to the numbered parts shown in Figure 2–1.

❶ Base and top.

❷ Front and rear bezels, one of which must be removed when you are replacing a component or changing the small computer system interface (SCSI) configuration.

Warning

Service procedures that involve accessing the rear of the shelf or removing the blower must be performed only by qualified service personnel.

To reduce the risk of electrical energy hazard, always disconnect the power cords from the shelf power supplies before removing shelf blower assemblies or performing service in the backplane area, such as modifying the SCSI bus.

❸ Front and rear doors, which are attached to bezels at the factory. These doors do not need to be removed for normal servicing.

❹ Two feet that can be mounted on either side. When installing multiple units, the feet on adjoining sides are reversed so that they do not extend beyond the sides of the vertical mounting kit.

❺ Eight bezel clips.

❻ A latch (factory-installed as part of the lock assembly).

❼ A lock (factory-installed as part of the lock assembly).

❽ A nut (factory-installed as part of the lock assembly).

❾ An ac distribution unit which can be replaced only by a qualified Digital Services engineer.

❿ A BA350–SA shelf.

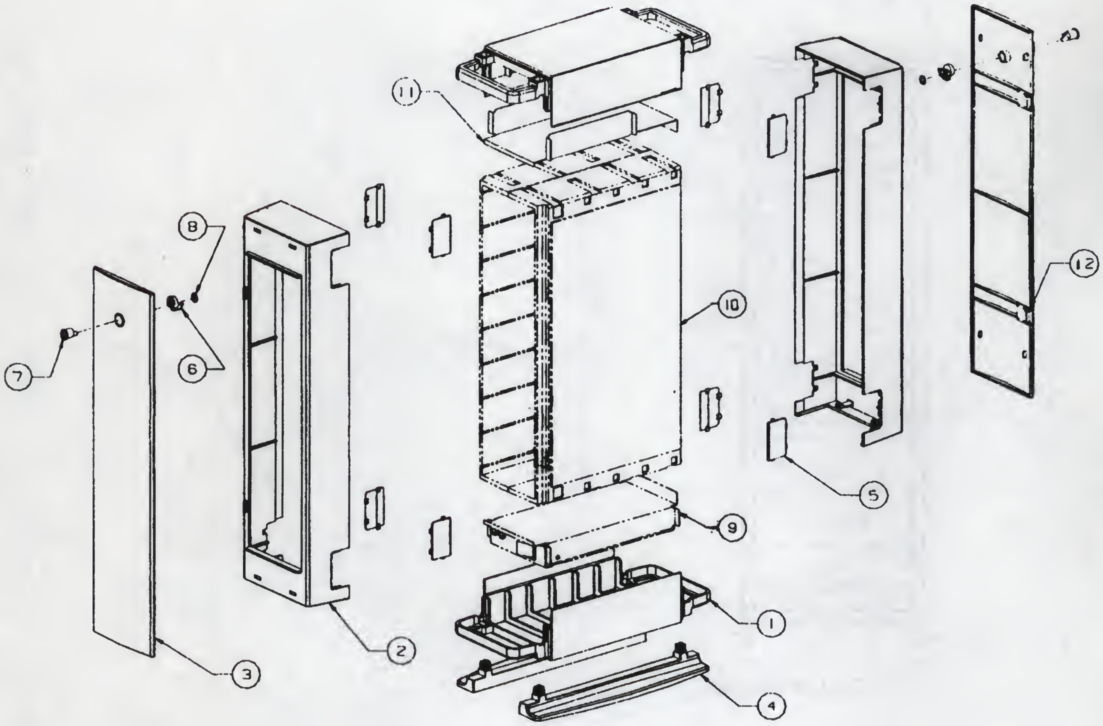
⓫ A mounting bracket that secures the top to the shelf. (The ac distribution unit secures the base to the shelf.)

⓬ Four hinges, two on each door.

Note

The majority of vertical mounting kit components are duplicates and are used in two places. For example, the base and top are identical. The only difference is their orientation.

Figure 2–1 BA35X–VA Vertical Mounting Kit Assembly Drawing

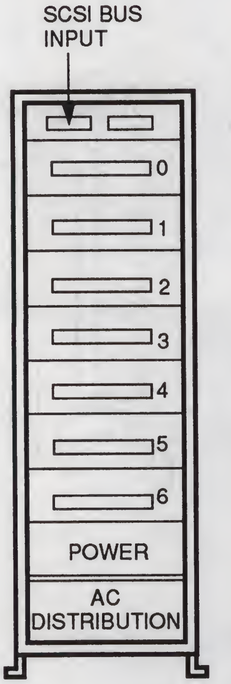


2.2 Installing SBBs

The location of storage SBBs in a shelf is primarily governed by two things: the SCSI bus and the stability of the vertical mounting kit. Having considered both of these factors, Digital recommends that you install SBBs in the following sequence (refer to Figure 2–2 for slot number locations):

1. Slot 7—Primary ac power supply
2. Slot 6—Redundant ac power supply, battery backup unit (BBU), or storage SBB
3. Slot 5—Storage SBB
4. Slot 4—Storage SBB
5. Slot 3—Storage SBB
6. Slot 2—Storage SBB
7. Slot 1—Storage SBB
8. Slot 0—Storage SBB

Figure 2–2 Slot Numbers



CXO-3633A-MC

2.3 Replacing SBBs or Blowers

To replace an SBB or blower, use the following procedure:

Step	Procedure
1.	Open the door.
2.	Grasp the bezel at the bottom with one hand and steady the vertical mounting kit with the other.
3.	Pull down on the two tabs located inside the bezel at the bottom and pull the bezel out and up.
4.	Lift the bezel off the top.
5.	Replace the SBB or blower as described in the shelf user's guide.
6.	Ensure that all eight bezel clips are firmly mounted and align the bezel with the top.
7.	Replace the bezel by holding the top of the bezel in place and rotating the lower part down and in.
8.	Snap the bezel into place on the base.
9.	Apply power and verify proper operation.
10.	Close the door.

EK

StorageWorks™ Solutions

SBB User's Guide

This guide describes the detailed procedures for replacing StorageWorks building blocks (SBBs). These procedures are applicable to *all* StorageWorks shelves except as noted.

The most critical factors relating to removing or replacing storage SBBs or expanding a StorageWorks system are as follows:

- The device type
- The SCSI bus device address

A label on the front of the SBB identifies the bus and device address for each storage device. Figure 1 and Figure 2 show the factory and user entered definitions on a typical SBB identification label.

Adding devices to a redundant array of independent disks (RAID) set can involve adding shelves and rerouting the SCSI buses. Rerouting a SCSI bus to a different shelf requires that the configured SBBs must be located in the same *logical* location, (the same bus and the same device address that they had prior to the expansion).

Replacing a Storage Device or a Power Unit

There are three methods for replacing SBBs, including power supplies: **hot swap**, **warm swap**, and **cold swap**. You must determine the appropriate replacement method prior to replacing a device or power supply.

The light emitting diodes (LEDs) on the front of the SBB indicate SBB status, either active or inactive. The three SBB replacement methods are listed as follows:

> **CAUTION**
>
> If you are not certain that your SCSI controller supports hot swap, Digital recommends using warm swap to protect the integrity of your data.

1. Use hot swap to remove and replace SBBs from a system that is online and active. Not all controllers support hot swap. *Only* Digital HSZ10, and HSZ15 controllers support hot swap.

   Read the controller documentation to determine which controller-supported swap method to use.

   Use hot swap to replace power supplies *only* when there are two power supplies in a shelf. You can remove the failed power supply while the other furnishes the power.

> **CAUTION**
>
> Warm swap *only* if the device activity LED is *off* and the controller supports warm swap. The following Digital controllers support warm swap: HSD30-series, HSJ30-series, HSJ40-series, HSZ40-series and.HSD05.

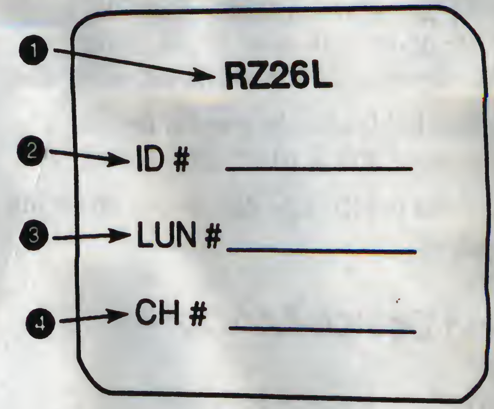
2. Use warm swap *only* if you quiesce the bus. Quiesce the bus by removing all signal activity.
3. Use cold swap during initial installation or when adding shelves. All devices are inactive and without power and are not operational until power is restored.

SBB Identification Labels

The SBB identification label shows the SBB device, the shelf bus type (8- or 16-bit), and user specific information. Two types of SBB identification labels are listed below:

- 8-bit identification label (See Figure 1.)
- 16-bit identification label (See Figure 2.)

Figure 1 8-Bit SBB Identification Label



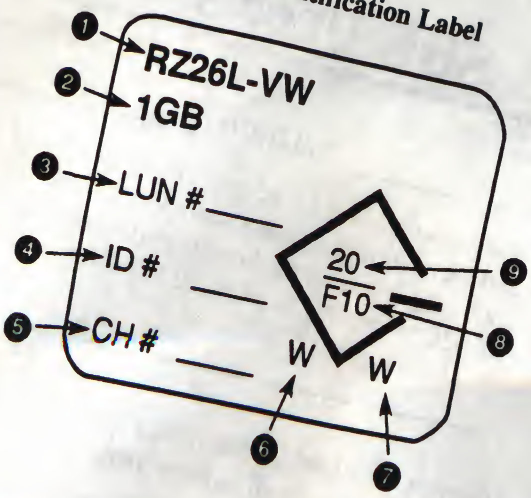
CXO-4466A-MC

The description of the 8-bit SBB identification label nouns and symbols are described as follows:

1. **Order Number** is the type of the installed device.
2. **SCSI ID** is assigned by the user.
3. **SCSI Logical Unit Number** is assigned by the user.
4. **Controller Channel Number** is assigned by the user.

December 1994

Figure 2 16-Bit SBB Identification Label



The description of the 16-bit SBB identification label nouns and symbols are described as follows:

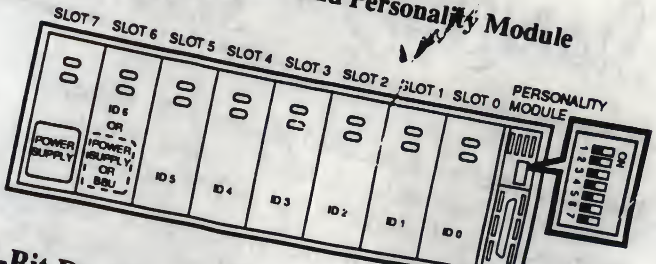
1. **Order Number** is the type of device.
2. **Capacity** is the total amount of data the device stores.
3. **SCSI Logical Unit Number** is assigned by the user.
4. **SCSI ID** is assigned by the user.
5. **Controller Channel Number** is assigned by the user.
6. **Device Bus Width** is either narrow (N) or wide (W).
   N is a 8-bit device
   W is a 16-bit device
7. **Device Bus Compatibility** is the type of shelf in which the device functions:
   N - the device is 8-bit shelf compatibile.
   W - the device is 16-bit shelf compatibile.
   N/W - the device is compatible with either shelf.
8. **Bus Bit Rate in Mbits** is the speed of the bus.
   For example, **F10** is 10 Mbits per second.
9. **Transfer Rate in MB** is the data transfer rate in MB per second.

Assigning Device Addresses

16-Bit Devices

There is no device address switch on a 16-bit, 3.5-inch SBB. The BA356 shelf and the personality module bus address switch, automatically set the device address. (See Figure 3.)

Figure 3 BA356 Shelf and Personality Module



8-Bit Devices

The device address switches are located on the rear of some SBBs. Use the following rules to assign device addresses to 8-bit SBBs (disk drives, tape drives) (see Figure 4 and Table 1):

1. All 8-bit SBB devices in a 16-bit shelf must be assigned to addresses 0 to 6.
2. Each device address is used once on a SCSI bus.
3. Each device address is used once on an SBB shelf *unless* the shelf has multiple buses, the SBBs have device address switches, and a personality module is installed (seeFigure 3).
4. An SBB has a six or an eight switch position device address switch. In all cases, the following is true:
   - Switch positions 1, 2, and 3 set the device SCSI address.
   - Switch positions 4, 5, and 6 disconnect the device address input from the backplane SCSI address setting.
   - Switch positions 7 and 8 are unused.
5. A 5.25-inch SBB can contain one full-height (FH), two half-height (HH) or three third-height (TH) devices. Use the following guidelines to set the device addresses on a 5.25-inch SBB with either two HH or three TH devices installed (see Figure 4).
   - Use the right switch to set the lower device address.
   - Use the middle switch to set the middle device address.
   - Use the left switch to set the upper device address.
6. Before installing the SBB in the shelf, set the device address switches on the rear of the SBB to one of the addresses shown in Table 1.

Figure 4 SBB Device Address Switches

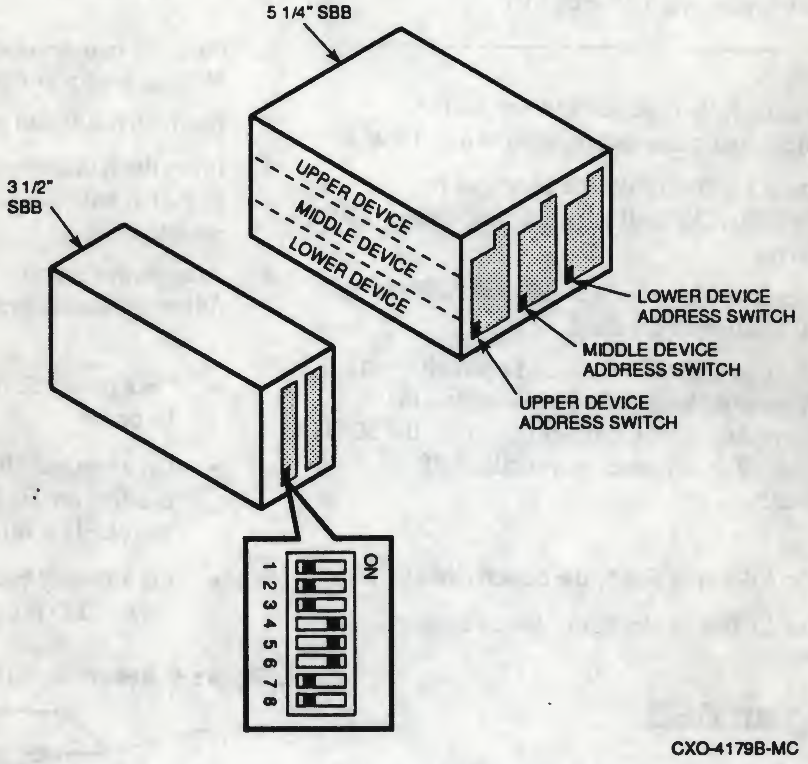


Table 1 SBB Device Address Switches

	Switch Number							
Address	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7*	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
Automatic †	OFF	OFF	OFF	ON	ON	ON	OFF	OFF

* Normally reserved for the host.

† Default setting; address is defined by the shelf connector.

Note

Only the middle switch is installed when there is a FH 5.25-inch device, or only one HH, or one TH 5.25-inch device in a 5.25-inch SBB.

- To use the default shelf device address, set the switches to the automatic setting as shown in Table 1.
- The maximum number of device addresses per StorageWorks BA356 shelf is 7 for a single shelf or 14 for two shelves.
- The SBB device address for 3.5-inch disk SBBs is by its physical location in the shelf.
- When there is no address switch or the switch is set to automatic, the shelf backplane connector and the personality module switch settings determine the SCSI device address For example, in a single shelf configuration:
  - If the SBB is in slot 5, the device address is 5.
  - If the SBB is in slot 3, the device address is 3.

Replacing an SBB

Use the following procedure to remove or replace an SBB:

CAUTION

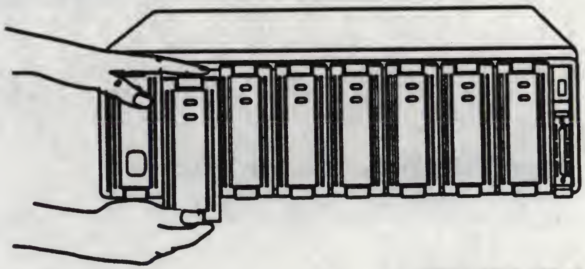
Be sure that the replacement device is the same model as the one being replaced. When removing or replacing an SBB, always use both hands to support the weight of the SBB.

CAUTION

Touching the SBB connector can cause electrostatic discharge (ESD) damage to the SBB.

1. Press the two mounting tabs together to release the SBB, as shown in Figure 5.
2. Use both hands and pull the SBB out of the shelf.
3. Insert the replacement SBB into the guide slots and push it in until it is fully seated and the mounting tabs engage the shelf.
4. After power is applied, observe the status LEDs for the following indications:
   - On a power SBB, both green status LEDs should be on.
   - On a storage SBB, the green device activity LED is either on, flashing, or off. The amber device fault LED is off.
   - On a battery backup unit SBB the amber charge status LED is on.

Figure 5 Removing an SBB from the Shelf



CXO-4439A-MC_R

2.4 Replacing a Shelf

To replace a shelf in a vertical mounting kit, perform the following procedure:

Step	Procedure
1.	Open the door.
2.	Turn off the ac power switches on the ac distribution unit.
3.	Disconnect the ac input power cord from the wall receptacle and from the ac distribution unit.
4.	Grasp the bezel at the bottom with one hand and steady the vertical mounting kit with the other.
5.	Pull down on the two tabs located inside the bezel at the bottom and pull the bezel out and up.
6.	Lift the bezel off the top.
7.	Disconnect the power cords from the ac power supplies.
8.	Record the slot number of each storage SBB.
9.	Starting with slot 0, remove all SBBs. Remove the ac power supply in slot 7 last.
10.	Record the connectors to which each SCSI cable is attached.
11.	Disconnect the SCSI cables from the shelf.
12.	Remove the rear bezel (repeat steps 4, 5, and 6).
13.	Remove the top.
14.	Remove the mounting bracket.
15.	Lift the shelf off the ac distribution unit.
16.	Align the shelf being installed so that slot 7 (the power slot) is at the bottom and the front of the shelf is over the front of the ac distribution unit.
17.	Install the mounting bracket and the top.
18.	Ensure that all eight bezel clips are firmly mounted and align the bezel with the top.
19.	Replace the bezel by holding the top of the bezel in place and rotating the lower part down and in.
20.	Snap the bezel into place on the base.
21.	Connect the SCSI cables as noted in step 10.
22.	Install the ac power supply in slot 7.
23.	Starting with slot 6, install the SBBs in the slots noted in step 8.
24.	Connect the ac power cord to the shelf power supply.
25.	Replace the front bezel (repeat steps 18, 19, and 20).
26.	Verify that the ac power switch on the ac distribution unit is in the off position.
27.	Connect the ac input power cord to the ac distribution unit.
28.	Turn on the ac power switch and verify that the SBBs, SCSI buses, and blowers are functioning properly.

Index

A

AC distribution unit, 1–3
AC power, 1–3
  See also Power cords
  distribution unit, 2–2
  input, 1–2
  switched, 1–3
  unswitched, 1–3

B

BA350–EA shelf, 1–1, 1–2
  replacing, 2–5
BA350–SA shelf, 1–1, 1–2
  replacing, 2–5
Blowers
  replacing, 2–4

C

Cables
  See Power cords
  See SCSI cables
Configuration rules, 1–2

D

Documentation
  related, v

P

Part number, 1–2
Parts, 2–2
Power cords, 1–4

S

Safety considerations, 1–3, 2–2
SBBs
  installation sequence, 2–3
  replacing, 2–4
SCSI buses, 1–2
SCSI cables, 2–5
Shelves
  BA350–EA, 1–1
Shelves (cont'd)
  BA350–SA, 1–1
Specifications
  physical, 1–2
Stability
  See Safety considerations
System building blocks
  See SBBs
SZ200 RAID subsystem, 1–3

V

Vertical mounting kit
  See also Configuration rules
  capacity, 1–1, 1–2
  components, 2–2
  double, 1–1, 1–3
  physical specifications, 1–2
  product description, 1–1
  single, 1–1

digital

Printed in U.S.A.